

# LTKAK2-L Series

## Modified SMT0-218 - 2 kA



### Maximum Ratings & Thermal Characteristics

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

| Parameter  | Symbol         | Value      | Unit             |
|--|----------------|------------|------------------|
| Operating Junction and Storage Temperature Range | $T_J, T_{STG}$ | -40 to 125 | $^\circ\text{C}$ |
| Current Rating <sup>1</sup>                      | $I_{PP}$       | 2          | kA               |

Notes: 1. Rated min  $I_{PP}$  measured with 8/20  $\mu\text{s}$  pulse.

### Functional Diagram



### Description

The LTKAK2-L series offers a clamping voltage lower than alternative technologies such as MOVs and GDTs. Rated to 2kA (8/20us) surge current, LTKAK2-L series offers a high level of protection for mission critical and high reliability applications. It aids compliance to surge requirements such as IEC 61000-4-5 (Level 4).

The compact surface mount SMT0218 package is compatible with automated PCBA processes and enables high power density designs

### Features & Benefits

- High Power TVS in a compact, surface mount, package
- Patent pending package design
- Ideal for automated PCB assembly process, reducing manufacturing costs and improving soldering quality, as compared to axial leaded packages
- Bi-directional devices
- Low clamping resistance enabling a low clamping voltage
- Meet MSL level 1, per J-STD-020, LF maximum peak of  $245^\circ\text{C}$
- Halogen free and RoHS compliant
- Pb-free E3 means 2<sup>nd</sup> level interconnect is Pb-free and the terminal finish material is tin (Sn) (IPC/JEDEC J-STD-609A.01)
- UL Recognized epoxy meeting flammability rating V-0

### Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

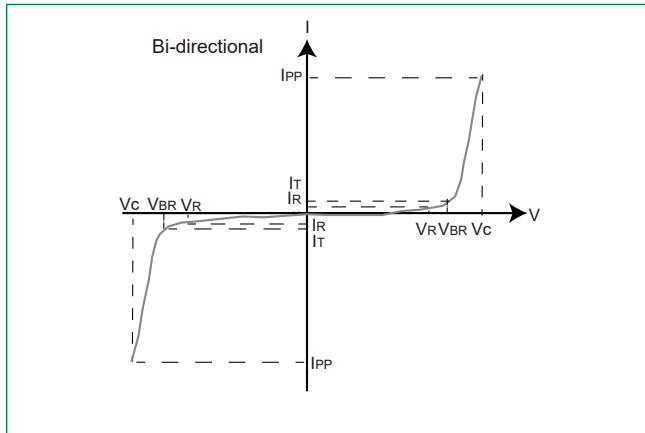
| Part Number (Uni) | Standoff Voltage (VSO) (V) | Max. Reverse Leakage ( $I_R$ ) @ $V_{SO}$ $\mu\text{A}$ | Reverse Breakdown Voltage ( $V_{BR}$ ) @ $I_T$ |           | Test Current $I_T$ (mA) | Max. Clamping Voltage $V_{CL}$ @ $I_{PP}$ Peak Pulse Current ( $I_{PP}$ ) (Note 1) |               | Max. Temp Coefficient of $V_{BR}$ (%/ $^\circ\text{C}$ ) | Max. Capacitance 0 Bias 10 kHz (nF) |
|-------------------|----------------------------|---|--|-----------|-------------------------|--|---------------|--|-------------------------------------|
|                   |                            |   | Min Volts                                      | Max Volts |                         | $V_{CL}$ Volts   | $I_{PP}$ Amps |  |                                     |
| LTKAK2-150C-L     | 150                        | 10  | 167.0  | 185.0     | 5                       | 243  | 2,000         | 0.1  | 7.0                                 |
| LTKAK2-160C-L     | 160                        | 10  | 178.0  | 197.0     | 5                       | 259  | 2,000         | 0.1  | 6.5                                 |
| LTKAK2-170C-L     | 170                        | 10  | 189.9  | 208.9     | 5                       | 275  | 2,000         | 0.1  | 6.5                                 |

Note: Using 8/20  $\mu\text{s}$  wave shape as defined in IEC 61000-4-5.

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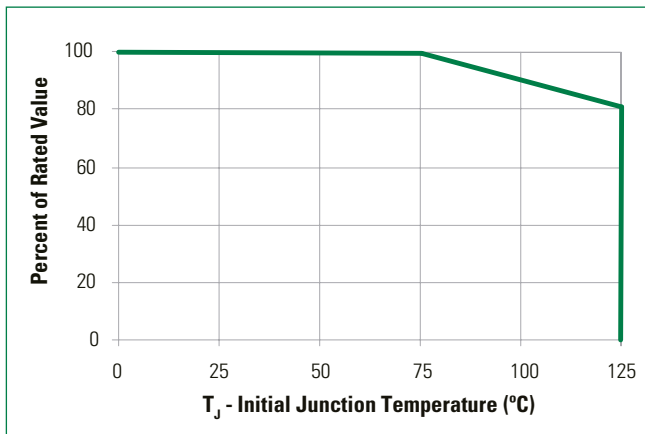
### I-V Curve Characteristics



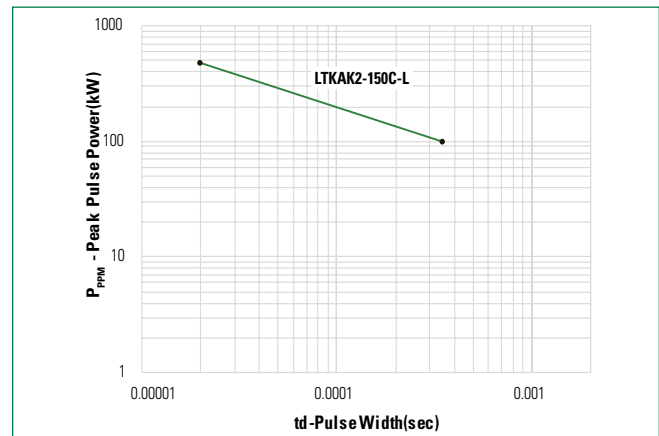
- $P_{PPM}$  Peak Pulse Power Dissipation** -- Max power dissipation  
 **$V_R$  Stand-off Voltage** -- Maximum voltage that can be applied to the TVS without operation  
 **$V_{BR}$  Breakdown Voltage** -- Maximum voltage that flows though the TVS at a specified test current ( $I_T$ )  
 **$V_C$  Clamping Voltage** -- Peak voltage measured across the TVS at a specified  $I_{ppm}$  (peak impulse current)  
 **$I_R$  Reverse Leakage Current** -- Current measured at  $V_R$   
 **$V_F$  Forward Voltage Drop for Uni-directional**

### Ratings and Characteristic Curves ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

#### Peak Power Derating



#### Typical Peak Pulse Power Rating Curve

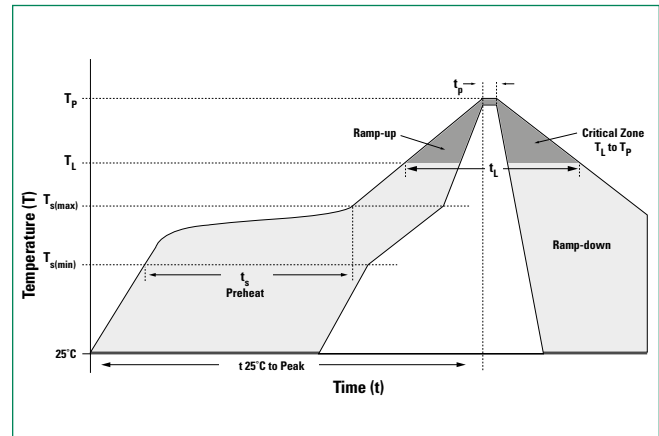


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### Soldering Parameters

|  |                                     |                         |
|--|-------------------------------------|-------------------------|
| <b>Reflow Condition</b>  |                                     | Lead-free assembly      |
| <b>Pre Heat</b>  | - Temperature Min ( $T_{s(\min)}$ ) | 150 °C                  |
|  | - Temperature Max ( $T_{s(\max)}$ ) | 200 °C                  |
|  | - Time (min to max) ( $t_s$ )       | 60 – 120 secs           |
| <b>Average ramp up rate (Liquidus Temp (<math>T_L</math>) to peak)</b> |                                     | 3 °C/second max         |
| <b><math>T_{s(\max)}</math> to <math>T_A</math> - Ramp-up Rate</b>     |                                     | 3 °C/second max         |
| <b>Reflow</b>  | - Temperature ( $T_L$ ) (Liquidus)  | 217 °C                  |
|  | - Time (min to max) ( $T_s$ )       | 60 – 150 seconds        |
| <b>Peak Temperature (<math>T_p</math>)</b>                             |                                     | 245 <sup>+0/-5</sup> °C |
| <b>Time within 5 °C of actual peak Temperature (<math>t_p</math>)</b>  |                                     | 30 seconds              |
| <b>Ramp-down Rate</b>  |                                     | 6 °C/second max         |
| <b>Time 25 °C to peak Temperature (<math>T_p</math>)</b>               |                                     | 8 minutes Max.          |
| <b>Do not exceed</b>   |                                     | 245 °C                  |



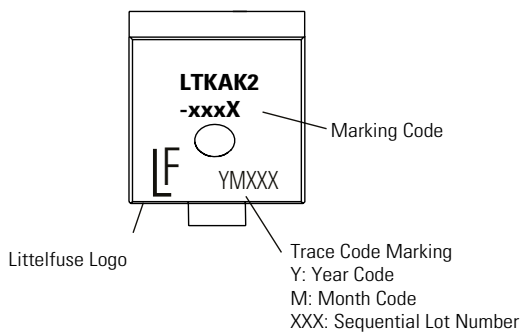
### Physical Specifications

|                 |  |
|-----------------|--|
| <b>Weight</b>   | Contact manufacturer                                   |
| <b>Case</b>     | Epoxy encapsulated                                     |
| <b>Terminal</b> | Tin plated lead, solderable per MIL-STD-202 Method 208 |

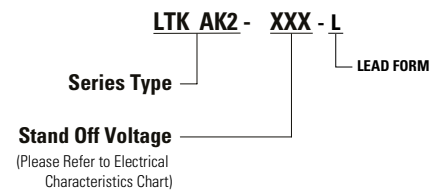
### Environmental Specifications

|                           |                    |
|---------------------------|--------------------|
| <b>High Temp. Storage</b> | JESD22-A103        |
| <b>HTRB</b>               | JESD22-A108        |
| <b>MSL</b>                | J-STD-020, Level 1 |
| <b>H3TRB</b>              | JESD22-A101        |
| <b>RSH</b>                | JESD22-B106        |

### Part Marking System



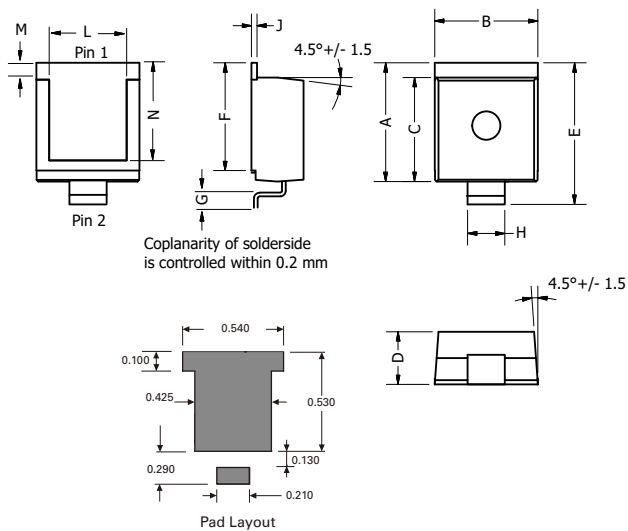
### Part Marking System



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### Dimensions



| Dimensions | Inches |       | Millimeters |       |
|------------|--------|-------|-------------|-------|
|            | Min    | Max   | Min         | Max   |
| A          | 0.621  | 0.655 | 15.78       | 16.63 |
| B          | 0.529  | 0.594 | 13.43       | 15.09 |
| C          | 0.544  | 0.561 | 13.83       | 14.24 |
| D          | 0.273  | 0.285 | 6.94        | 7.24  |
| E          | 0.768  | 0.843 | 19.52       | 21.42 |
| F          | 0.567  | 0.587 | 14.40       | 14.90 |
| G          | 0.087  | 0.126 | 2.20        | 3.20  |
| H          | 0.193  | 0.222 | 4.89        | 5.65  |
| J          | 0.028  | 0.033 | 0.72        | 0.85  |
| L          | 0.400  | 0.440 | 10.17       | 11.17 |
| M          | 0.073  | 0.112 | 1.85        | 2.85  |
| N          | 0.510  | 0.533 | 12.95       | 13.55 |

### Packaging

| Part number   | Weight | Packing Mode | Base Quantity |
|---------------|--------|--------------|---------------|
| LTKAK2-xxxC-L | 4.34g  | Tube pack    | 100 (25/Tube) |

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